USSR UDC: 681.327

BURDONSKIY, I. N., GRISHIN, M. P., KURBANOV, Sh. M., MARTYNOV, V. P., SERGEYEV, V. V., SIDORENKO, V. R., TSEREVITINOV, S. S., SHABUROVA, L. M., Moscow

"Computer Processing of Optical Interference Patterns"

Novosibirsk, Avtometriya, No 4, Jul/Aug 71, pp 21-26

Abstract: The paper is a report of initial experiments in using a photometric scanning system in conjunction with a general-purpose computer for analyzing halftone images (optical interference patterns). Line-scanning of the pattern was used for computer input through an analog-digital converter with 64 levels of quantization. A flowchart of the processing program is given. The results of computer processing on the Minsk-22 computer are compared with manual analysis for plasma interference patterns. Excellent agreement is observed with a time reduction of more than two orders of magnitude for machine processing. The authors thank V. S. Vaynshteyn and M. I. Pergament for taking part in the initial phase of the work. Three figures, bibliography of five titles.

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1/2 030 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--THE RETURN OF THE AUTOMATIC SPACE STATION ZOND-5 -U-

AUTHOR--MARKELOVA, L.

COUNTRY OF INFO--USSR

SOURCE--TRUD, SEPTEMBER 15, 1970, P 3, COLS 1-5

DATE PUBLISHED--15SEP70

SUBJECT AREAS--SPACE TECHNOLOGY

TOPIC TAGS--AUTOMATIC SPACE STATION, UNMANNED SPACECRAFT/(U)ZOND 5 CIRCUMLUNAR PROBE, (U)ZOND 6 CIRCUMLUNAR PROBE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605010/F09 STEP NO--UR/9025/70/000/000/0003/0003

CIRC ACCESSION NO--AN0140166
UNCLASSIFIED

2/2 030 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AN0140166

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE IS A REHASH OF DETAILS OF THE LAUNCHING AND RETURN OF THE "ZOND-5", A SPACE STATION LAUNCHED ON SEPTEMBER 15, 1968. THE AUTHOR OF THE ARTICLE QUOTES CANDIDATE OF TECHNICAL SCIENCES F. TOLEVICH AS SAYING THAT LAUNCHING OF "ZOND-5", AND "ZOND-6" PROVED THAT AUTOMATIC UNMANNED VEHICLES CAN BE USED FOR EXTENSIVE EXPLORATIONS OF THE NEAR THE MOON SPACE, IN DEEP SPACE, NEAR OR ON THE HEAVENLY BODIES.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002201920019-5"

USSR

UDC 632.954+581.14

MARKELOVA, R. I.

"The Effects of Simazin and Dalapon on Some Growth Characteristic of Black Currants"

Minsk, Izvestiya Akademii Nauk BSSR, No 4, 1971, pp 27-30

Translation: The effects of the herbicides simazin and dalapon on growth processes (total number of sprouts, weight of the sprouts, and the number and weight of buds on the sprouts) in black currants of the fruit-bearing Liya and Neapolitanskaya strains were studied. It was found that application of herbicides (especially simazin) promoted the growth of the vegetative mass and of the reproductive organs, and stimulated the meristematic activity in lateral growth points, with the result that some axial buds changed into complex structures consisting of 2-7 simple buds. The herbicides were most effective on fertilized soil. The different currant strains displayed varying sensitivity to the herbicides.

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USSR

UDC 543.39

ZHARIKOVA, G. G., MARKELOVA, S. I., BOBKOVA, T. S., LANDAU, N. S., SHOLINA, G. S., and SILAYEV, A. B., Moscow State University imeni M. V. Lomonosov, Moscow

"Destruction of Lacquer and Paint Coatings by Bacteria and Actinomycetes"

Moscow, Prikladnaya Biokhimiya i Mikrobiologiya, Vol 7, No 2, Mar-Apr 71, pp 236-242

Abstract: From the soil of various regions of the USSR, the following strains of bacteria and Actinomycetes were isolated which were found to cause destruction of surface coatings: Bacillus sphaericus var. 2P, Bac. cohaerens var. 4P, Bac. subtilis var. 1B, Flavobacterium acetylicum var. 7P, Mycobacterium sp. var. 1P, Propionibacterium pentosaceum var. 4B, Micrococcus aurantiacus var. 14C, Micrococcus aurantiacus var. 16 C, Actinomyces globisporus var. 9B, Actinomyces globisporus var. 10C, Actinomyces sp. Var. 10B. The cultural, morphological, and biochemical characteristics of the eight bacterial strains were determined. The behavior of surface coatings based on epoxy resin, alkyd resin, teflon, pentaphthalic resin, PVC, and organosilicon resin with respect to the 11 microorganisms isolated was determined in tests in which a sample of the surface coating was kept for 1 yr in contact with

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USSR

ZHARIKOVA, G. G., et al., Prikladnaya Biokhimiya i Mikrobiologiya, Vol 7, No 2, Mar-Apr 71, pp 236-242

a culture medium containing (in g/l.) $CaCO_3$ 3, $MgSO_4$ 0.5, KH_2PO_4 1, KCl 0.2, agar 20 (pH 7.0-7.5). The only source of C for the microorganism was the coating. The samples were examined every month. The behavior of alkyd resin, epoxy resin, and teflon coatings with respect to mixtures of some of the microorganisms was determined in similar tests. The results of the tests are tabulated. The bacteria and actinomucetes isolated can be used for determining whether or not a surface coating is resistant to the action of microorganisms.

2/2

Acc. Nr: AP0034406 Ref. Code: UR 0297

PRIMARY SOURCE: Antibiotiki, 1970, Vol 15, Nr 2, pp 161-165

BIOSYNTHESIS OF GRAMICIDIN C ON SYNTHETIC MEDIA WITH AMINO ACIDS AS THE ONLY SOURCE OF NITROGEN

G. G. Zharikova, S. I. Marhelyuva

Moscow State University

The following amino acids as the only source of nitrogen were used in the medium: glycocol, alanin, serin, cystein, threonin, valin, leucin, norleucin, asparaginic acid, lysin, ornithin, β-phenyl-α-alanin, β-phenyl-β-alanin, triptophan and histidin. The effect of the amino acids on growth of 4 variants of Bac. brevis var. G. B., that is R, S, P+ and P- and the antibiotic biosynthesis was investigated. It was found that cells of all the variants of Bac. brevis var. G. B. were capable of using amino acids as the only source of nitrogen, while the rate of their consumption was different. On synthetic media with amino acids (9 out of 15) the cells of variant R synthesized gramicidin C, whereas the cells of variant P+ synthesized gramicidin C only on media with glycocol, serin, norleucin, asparaginic acid, lysin, ornithin histidin. The cells of variant S grown on media with serin, valin and histidin produced only traces of the antibiotic and the cells of variant P- produced no antibiotic. Specific peculiarities of each variant with respect to consumption of amino acids as the only source of nitrogen were shown.

D.M.

1/2 020 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--COPOLYMERIZATION OF CROTONIC DERIVATIVES OF ISONICOTINIC ACID HYDRAZIDE WITH VINYLPYRROLIDONE -U-

AUTHOR-(03)-KROPACHEV, V.A., MAKKELOVA, T.M., TRUKHMANOVA, L.B.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL SOEDIN., SER. A 1970, 12(5), 1091-6.

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--COPOLYMERIZATION, CHEMICAL REACTION RATE, ORGANIC NITRILE COMPOUND, NICOTINIC ACID

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1374 STEP NO--UR/0459/70/012/005/1091/1096

CIRC ACCESSION NO--AP0133[illegible]

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0135048

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COPOLYMN. OF N,VINYL,2,PYRROLIDONE (I) WITH N,ISONICOTINOYL,N',CROTONOYLHYDRAZINE (II) IN THE PRESENCE OF AZOBISISOBUTYRONITRILE GAVE III. THE REACTIVITY RATIOS ARE 0.04 PLUS OR MINUS 0.04 FOR I AND 0.58 PLUS OR MINUS 0.02 FOR II. THE MAX. YIELD WAS 80PERCENT. THE SOLY. OF III IN WATER DECREASED WITH DECREASING NO. OF II UNITS IN THE CHAIN. III IS INSOL. IN WATER WHEN GREATER THAN OR EQUAL TO 26 MOLE PERCENT II UNITS ARE PRESENT. SIMILARLY, I WAS COPOLYMD. WITH N,ISONICOTINOYL,N PRIME, CROTYLIDENEHYDRAZINE, BUT THE POLYMN. RATES WERE VERY SLOW AND ONLY SIMILAR TO 6PERCENT COPOLYMER WAS OBTAINED. FACILITY: INST. VYSOKOMOL. SOEDIN., LENINGRAD, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002201920019-5"

AN9 043468

UR 9022

AUTHOR-- MARKELOVA, V.

TITLE-- "HEAVENLY" FOOD

NEWSPAPER-- SOVETSKAYA ROSSIYA, OCTOBER 19, 1969, P 2, COLS 1-4

ABSTRACT-- IN HIS COMMENTS ON THE FOOD USED BY ASTRONAUTS OF "SOYUZ" SHIPS, A. A. POKROVSKIY, DIRECTOR, INSTITUTE OF NUTRITION OF THE ACADEMY OF MEDICAL SCIENCES, HAS MENTIONED SPIRULINAE, AN ALGAE FOUND IN LAKE CHAD IN AFRICA.

1/1 1944 2115

Acc. Nr: AP0044158 Ref. Code: UR 0244

PRIMARY SOURCE: Voprosy Pitaniya, 1970, Vol 29, Nr 1, pp 34-38

THE MODE OF INFLUENCE EXERTED BY DIVERSE CARBOHYDRATE DIETS ON THE FORMATION OF FATTY ACIDS IN THE ORGANS OF RATS

V. F. Markelova, B. G. Luapkov (Moscow)

Summary

Excess amounts of complex carbohydrates in a food ration of high-standard caloric value brings on after 30 days of testing an increase of the fatty acids content in the liver, blood and aorta, along with the intensified activity of glucose-6-phosphate-dehydrogenase and accelerated incorporation of 1-6C^{14}-glucose and 2-C^{14}-acetate into fatty acids of the liver. Substitution of saccharase for a portion of starch in a high-standard food ration gives rise to anlogous changes with a somewhat more notable increase in the amount of fatty acids in the blood and the aorta. The recorded rise of pyroracemic, oxalo-acetic and α-ketoglutaric acids in the liver of rats receiving saccharose in the diet could be consequent to the specific effect of fructose and possible stimulation of the insular system leading to accelerated glycolysis, suppression of the gluconeogenetic enzymes synthesis and to transamination.

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Acc. Nr: AP0051921 Ref. Code: UR 0219

PRIMARY SOURCE: Byulleten' Eksperimental'noy Biologii i Meditsiny, 1970, Vol 69, Nr 2, pp 49-52

THE EFFECT OF VEGETABLE AND ANIMAL FATS ON THE DISTRIBUTION OF EXOGENOUS CHOLESTEROL IN ANIMALS

V. F. Markelova, B. G. Lyapkov

Institute of Nutrition of the AMS of the USSR, Moscow

Absorption and the nature of distribution of a one-time introduced labeled cholesterol dissolved in sunflower oil were investigated in rats which received isocaloric food rations containing 27 or 60% of lard or vegetable oil (calculated to the value of their caloricity). Diets with sunflower oil, particularly those containing large amounts of it, contributed to the increase of the radioactive cholesterol in the liver, as compared to other rations with lard. Inclusion of sunflower oil in the diet was found to be followed by an increase of the cholesterol level in the blood, liver and by its fall in the fatty tissue.

REEL/FRAME
19820404

USSR UDC 669.15.018.8:620.196.2

ZAKHAROV, YU. V., LEVIN, F. L., SENTYUREV, V. P., GRISHIN, A. N., and MARKESHIN, V. S.

"Intercrystalline Corrosion of Alloys With 20% Cr and 40% Ni as a Function of Alloying"

Sb. tr. TsNII chern. metallurgii (Collection of Works of Central Scientific Research Institute of Ferrous Metallurgy), 1970, vyp. 77, pp 95-98 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 3I592 by authors)

Translation: The article investigates the effect of C, Nb, Mn, Si, Cr, N, Al on the resistance of austenitic Fe-Cr-Ni alloys with 20% Cr and 40% Ni to intercrystalline corrosion in the 500-900° range with holding periods up to 5000 hours. It is shown that alloying with manganese and aluminum sharply lowers the resistance of the alloys to intercrystalline corrosion after provoking heatings. A rise in austenitizing temperature to 1200° contributes to a diminution of resistance. One illustration. Two tables.

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USSR

UDC 669.15.018.8:620.194.2

ZAKHAROV, YU. V., SENTYUREV, V. P., MARKESHIN, V. S., GRISHIN, A. M., and LEVIN, F. L.

"Stress Corrosion Cracking of Austenitic Steels and Alloys in Boiling 42% Magnesium Chloride"

Sb. tr. TsNII chern. metallurgii (Collection of Works of Central Scientific Research Institute of Ferrous Metallurgy), 1970, vyp. 77, pp 99-101 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 31597 by authors)

Translation: A study was made of the effect of Ni (10-40%) on the resistance of austenitic steels and alloys (0.02-0.05% C, ~18% Cr, 1-2% Mn, Ti, Nb) to stress corrosion cracking in boiling 42% magnesium chloride. Ultimate long-term corrosion strength values according to Ni content were determined. The results of the work make it possible to give some explanations of the reasons for the contradictory nature of data in the literature on the effect of alloying elements on the stress corrosion resistance of austenitic steels and alloys. Two illustrations. One table. Bibliography with nine titles.

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USSR UDC 669.14.018.8

ZAKHAROV, YU. V., LEVIN, F. L., SENTYUREV, V. P., GRISHIN, A. M., and MARKESHIN, V. S.

"Intercrystalline Corrosion of Alloys with 20% Cr and 40% Ni as a Function of Alloying"

Spetsial'nyye Stali i Splavy (Special Steels and Alloys -- Collection of Works), No 77, Metallurgiya Press, 1970, pp 95-98

Translation: The influence of C, Nb, Mn, Si, Cr, N, and Al on the stability of iron-chromium-nickel austenitic alloys with 20% Cr and 40% Ni against intercrystalline corrosion (ICC) is studied in the 500-900°C temperature interval with holding times up to 5,000 hours.

It is demonstrated that alloying of the alloys with manganese and aluminum sharply decreases their resistance to ICC after provoking heating. A decrease in resistance is facilitated by increasing the austenitization temperature to 1200°C. 1 figure; 2 tables.

USSR UDC 669.14.018.8:620.194.2

ZAKHAROV, YU. V., SENTYUREV, V. P., MARKESHIN, V. S., GRISHIN, A. M., and LEVIN, F. L.

"Corrosion Cracking of Austenitic Steels and Alloys in Boiling 42% Magnesium Chloride"

Spetsial'nyye Stali i Splavy (Special Steels and Alloys -- Collection of Works), No 77, Metallurgiya Press, 1970, pp 99-101

Translation: The influence of nickel on the stability of austenitic steels and alloys to corrosion cracking in boiling 42% magnesium chloride is studied. The values of the long-term corrosion resistance limit are determined as functions of the nickel content. The results of the work make it possible to explain the reasons for the contradictory data from the literature on the influence of alloying elements on the resistance of austenitic steels and alloys to corrosion cracking. 2 figures; 1 table; 9 biblio. refs.

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USSR UDC: 621.371.029.4

MARKEVA, Yu. M. and MOLCHANOV, O. A.

"Analysis of Whistlers Simultaneously Received at a Distance of 700 km"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. Sekts. 3 (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses; Section 3--collection of works) "Nauka," 1972 pp 124-128 (from RZh--Radiotekhnika, No 10, 1972, Abstract No 10A372)

Translation: Analysis is made of multicomponent whistlers received simultaneously by two ships drifting in the Indian Ocean at distances of about 700 km from each other. The obtained results may serve as the basis for a quantitative estimate of the effectiveness of wave channeling for ultra-low frequency waves in the magnetosphere. Two illustrations, bibliography of four. N. S.

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1/2 020 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--RADICAL COPOLYMERIZATION OF TETRAFLUOROETHYLENE WITH ETHYLENE AND HEXAFLUOROPROPYLENE -U-

AUTHOR-(03)-KABANKIN, A.S., BALABANOVA, S.A., MARKEVICH, A.M.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER A 1970, 12(2), 267-72

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--COPOLYMERIZATION, POLYTETRAFLUOROETHYLENE, ETHYLENE, PROPYLENE, FLUORINATED ORGANIC COMPOUND, PHOTOPOLYMERIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1197 STEP NO--UR/0459/70/012/002/0267/0272

CIRC ACCESSION NO--AP0104563

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0104563

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RELATIVE REACTIVITIES OF C SUB2 H SUB4 AND C SUB2 F SUB4 IN PHOTOINITIATED COPOLYMN. AT LOW PERESSURE ARE 0.38 AND 0.1 IN THE GAS PHASE AND 0.61 AND 0.024 IN (F SUB3 CCF SUB3) SUB3 N SOLN., RESP. THE DIFFERENCE IS ATTRIBUTED TO HETEROGENEITY OF THE MEDIUM. THE VALUES ARE USED TO PREP. C SUB2 H SUB4-C SUB2 F SUB4 COPOLYMER OF CONST. COMPN. RELATIVE REACTIVITIES OF C SUB2 F SUB4 AND HEXAFLUOROPROPYLENE ARE 3.5 AND 0, RESP., IN THE GAS PHASE.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--11DEC70

TITLE--OPERATIONAL CONTROL OF LABOR INDICATORS AT AN ENTERPRISE -U-

AUTHOR--MARKEVICH, F.K.

COUNTRY OF INFO--USSR

SOURCE--OPERATIONAL CONTROL OF LABOR INDICATORS AT AN ENTERPRISE (OPERATIVNYY KONTROL' TRUDOVYKH POKAZATELEY NA PREDPRIYATII) MOSCOW, DATE PUBLISHED--------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--WORKING CONDITION, INDUSTRIAL FACILITY MANAGEMENT, PERSONNEL MANAGEMENT, BONUS, SALARY SCHEDULE, FRINGE BENEFIT, LABOR POLICY, MANAGEMENT PERSONNEL, INDUSTRIAL PERSONNEL, ENGINEERING PERSONNEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0047 STEP NO--UR/0000/70/000/000/0001/0203

CIRC ACCESSION NO--AM0123830

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AM0123830

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TABLE OF CONTENTS: CHAPTER I A SYSTEM FOR CONTROL OF THE WORKING TIME 8. II PROCEDURES IN CONTROL OF ROUTINE VACATIONS 35. III A SYSTEM FOR CONTROL OF THE NUMBER OF EMPLOYEES, PAY RATES AND TAXES 45. IV CONTROL SYSTEM IN DIRECT PIECE RATE PAY FOR WORKERS 85. V PROCEDURES IN THE USE OF BONUS SYSTEMS FOR WORKERS AND OPERATIONAL CONTROL 111. VI PROCEDURES IN THE USE OF THE BONUS SYSTEM FOR ADMINISTRATORS, ENGINEERING TECHNICAL PERSONNEL, AND OPERATIONAL CONTROL 139. VII PROCEDURES FOR CONTROL OF REMUNERATION OF REJECTS AND DEDUCTIONS FOR REJECTS 159. VIII ORGANIZATION OF CONTROL IN FULFILLMENT OF THE PLAN FOR IMPROVEMENT OF INDUSTRIAL EFFICIENCY 186. IX PROCEDURES IN OPERATIONAL CONTROL OF ADDITIONAL PAYMENTS 192. ON THE BASIS OF A GENERALIZATION OF THE EXPERIENCE OF INDIVIDUAL ENTERPRISES, THE AUTHOR PROPOSES A SYSTEM FOR OPERATIONAL CONTROL OF LABOR INDICATORS, WHICH SHOULD FORM THE BASIS OF OPERATIONS OF LABOR AND WAGE DEPARTMENTS OF INDUSTRIAL ENTERPRISES. THE BOOK WAS WRITTEN FOR EMPLOYEES OF INDUSTRIAL ENTERPRISES WORKING ON ORGANIZATION OF LABOR AND WAGES.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--FORMATION OF A POLYCONJUGATED POLYMER DURING THE THERMAL DECOMPOSITION OF POLYACENAPHTHYLENE -U-

AUTHOR-(05)-MARKEVICH, I.N., BEYLIN, S.I., TETERINA, M.P., KARPACHEVA, G.P., POLGOPLOSK, B.A.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(2), 362-5

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CONJUGATED POLYMER, THERMAL DECOMPOSITION, NAPHTHALENE, NAPHTHENE, POLYMER STRUCTURE, CHEMICAL KINETICS, PYROLYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1092 STEP NO--UR/0020/70/191/002/0362/0365

CIRC ACCESSION NO--AT0124749

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0124749

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THERMAL DECOMPN. OF POLYACENAPHTHYLENE (I) IN PHCL AND IN BULK STARTS AT 180DEGREES AND 335-45DEGREES, RESP. THE PRODUCTS CONTAIN ACENAPHTHENE, ACENAPHTYLENE (II) A CONJUGATED POLYMER, BUT NO H. ON THE BASIS OF IR AND EPR SPECTROSCOPY THE POLYMER WAS ASSIGNED STRUCTURE III (N EQUALS 5-7). THE FORMATION OF III INVOLVES THE SPLITTING OFF OF II FROM I AND THE REDN. OF II WITH I. THE KINETICS OF I MOL. WT. DECREASE DURING THE PYROLYSIS IS DISCUSSED. FACILITY: INST. NEFTEKHIM. SIN. IM. TOPCHIEVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 031 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PROSPECTIVE METHODS FOR NONDESTRUCTIVE QUALITY AND RELIABILITY CONTROL OF PARTS FOR MODERN MACHINES -U-
AUTHOR--MARKEVICH, K.V.

COUNTRY OF INFO--USSR

SOURCE--KIEV, TEKHNOLOGIYA I ORGANIZATSIYA PROIZVODSTVA, NO 1, 1970, PP 18-19
DATE PUBLISHED--------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, METHODS AND EQUIPMENT

TOPIC TAGS--RELIABILITY, MACHINE TOOL COMPONENT, QUALITY CONTROL, NONDESTRUCTIVE TEST, ULTRASONIC FLAW DETECTOR, MAGNETIC JOINT INSPECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1348 STEP NO--UR/0418/70/000/001/0018/0019

CIRC ACCESSION NO--AP0123306
UNCLASSIFIED

THAT ELECTROMAGNETIC AND ULTRASONIC METHODS FOR CONTROLLING THE QUALITY OF PARTS WILL FIND BROAD APPLICATION IN THE NEAR FUTURE. THIS CONCLUSION IS BASED ON THE ANALYSIS OF RESULTS OBTAINED FROM THE INTRODUCTION OF RESEARCH ON THE NONDESTRUCTIVE CONTROL OF THE QUALITY AND RELIABILITY OF MACHINE PARTS.

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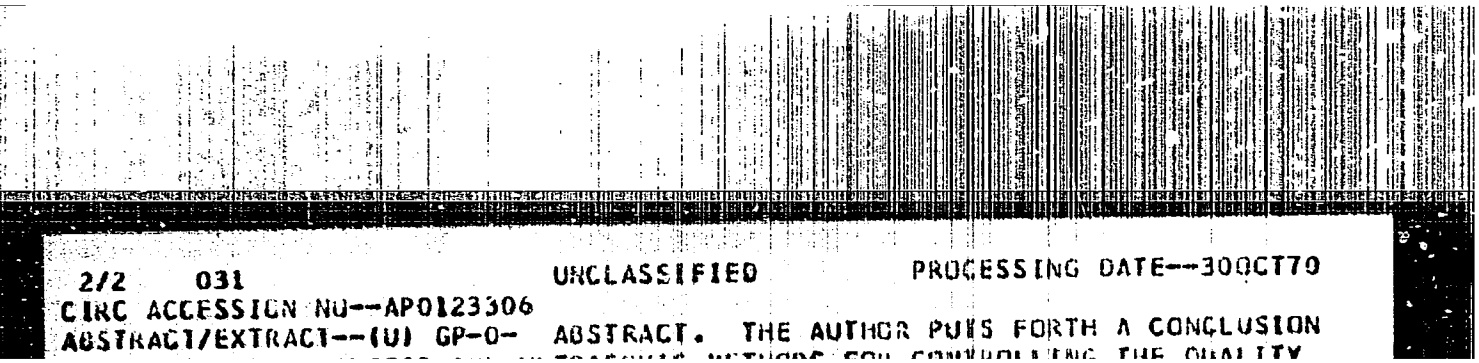

2/2 031 UNCLASSIFIED PROCESSING DATE--30OCT70
CIRC ACCESSION NO--AP0123306
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHOR PUTS FORTH A CONCLUSION

2/2 025 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0124389

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FOLLOWING 2 MECHANISMS ARE CONSIDERED FOR THE ANIONIC POLYMN. OF HCHO IN THE PRESENCE OF ET SUB3 N: (1) ET SUB3 N PLUS H SUB2 O IN EQUILIBRIUM TO ET SUB3 N PRIME POSITIVE H PLUS OH PRIME NEGATIVE; OH PRIME NEGATIVE PLUS HCHO YIELDS HOCH SUB2 O PRIME NEGATIVE. THE POLYMER CHAIN GROWTH INVOLVES (HO(CH2 UB2 O) SUBN CH SUB2 O PRIME NEGATIVE)HNET SUB3 PRIME POSITIVE (I) AS THE ACTIVE CENTER; H SUB2 O MUST BE PRESENT AS THE COCATALYST. (2) ET SUB2 N PLUS HCHO YIELDS ET SUB3 N PRIME POSITIVE CH SUB2 O PRIME NEGATIVE. THE POLYMER CHAIN GROWTH INVOLVES THE ZWITTERION ET SUB3 N PRIME POSITIVE (CH SUB2 O) SUBN CH SUB2 O PRIME NEGATIVE (II). HCHO WAS POLYMD. IN PHME OR IN THE GAS PHASE IN THE PRESENCE OF ET SUB3 N. THE POLYMN. MIXTS. WERE EXTD. WITH PHNO SUB2 AT 100DEGREES. THE EXTS. DID NOT HAVE COMPDS. OF TYPE II AS SHOWN BY COMPARING NMR SPECTRA OF THE EXTS. WITH THE SPECTRUM OF (ET SUB3 NCH SUB2 OME) PRIME POSITIVE CL PRIME NEGATIVE. THUS, MECHANISM (1), POSSIBLY ALSO INVOLVING FAST PROTON EXCHANGE (E. K. RALPH, ET AL., 1967), IS PREFERRED. FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

Hydrobiology

USSR

MARKEVICH, G. P., Academician of the Academy of Sciences Ukrainian SSR and BEREZKIN, O. G., Candidate of Biological Sciences

"Activities of the Odessa Department of the Institute of Biology of the Southern Seas"

Kiev, Vestnik Akademii Nauk Ukrainskoy SSR, No 9, 1971, pp 89-90

Abstract: Transactions of a conference dedicated to an analysis of the activities of the Odessa Department of the Institute of Biology of the Southern Seas (InBPM) held in Odessa 24-25 May 71 are reported. Scientists of the Academy of Sciences Ukrainian SSR and biologists of Odessa State University and Odessa Agricultural and Medical Institutes, 100 persons in all, participated in the conference. Doctor of Biological Sciences and Head of the Odessa Department of InBPM K. O. Vinogradov spoke about the scientific and organizational work carried out at the Department. Organized in 1963, it now employs 87 persons equally divided between three sections: ecological and biogeographical; hyponeuston; and biochemistry of marine organisms. He reported achievements made in the study of the laws governing the productive processes at sea-land and sea-river contact zones; the significance of the neuston phase in the development of ecological processes in the Southern seas; and

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002201920019-5"

USSR

MARKEVICH, O. P., and BEREZKIN, O. G., Vestnik Akademii Nauk Ukrainskoy SSR, No 9, 1971, pp 89-90

the biochemistry of marine organisms' adaptation in onto- and phylogensis. The results of these studies have been published in 13 monographs and more than 300 articles. Yu. P. Zaytsev, a corresponding member of the Academy of Sciences Ukrainian SSR, emphasized the fact that the study of neuston is a priority subject at the department; other objectives are the investigations of fish resources, improvement of methods of finding the fish, and development of scientific methods of conservation of life in the seas and oceans. Reports given at sectional sessions enconpassed a wide range of topics, such as the development of the ecological biochemistry of marine organisms; the formation of ecological systems in the seas and oceans; the presence of neuston microorganisms -- bacterioneuston, many of which have been found to have destructive properties with respect to oils and fatty acids, and which in a sense serve as sanitary workers of the sea and ocean waters. Talks were given also on the role which light plays in the vital activities of sea life. In a resolution adopted by the participants in the conference, recognition was given to the importance of the work being carried on at the department and the tasks which are to carried out by the collective of department in the years of 1971-1975 were outlined.
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USSR

UDC 541.15+539.199+538.113

GOL'DIN, S. I., SHARPATYY, V. A., and MARKEVICH, S. V., Institute of Physico-Organic Chemistry, Belorussian Academy of Sciences, Minsk, and Institute of Chemical Physics, USSR Academy of Sciences, Moscow

"Formation and Conversion of Radicals in Glucose Polymers during γ-Radiolysis"

Moscow, Doklady Akademii Nauk SSSR, Vol 201, No 1, Nov-Dec 1971, pp 133-136

Abstract: The epr method is used to study the nature of radicals formed during radiolysis (77° and 300°K) of dry samples of native dextrane, polyglucin and glucose, both undeuterated and deuterated (70-80% in polyglucin, 80-90% in glucose), in the hydroxyl groups.

The majority of radicals formed during radiolysis of glucose and its high polymers were identical; the basic differences were associated with structural peculiarities of the polymers and the glucose, and with the presence of some water of crystallization.

Tables are given to show the characteristics of radicals identified by epr spectra; also data on the properties of radicals identified in glucose, where differences exist in comparison with those in polysaccharides. It

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USSR

GOL'DIN, S. I., et al., Doklady Akademii Nauk SSSR, Vol 201, No 1, Nov-Dec 1971, pp 133-136

is believed that the primary radicals are formed during cleavage of C—H and C—OH bonds.

2/2

1/2 012 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--STABILITY OF THE TRIANGULAR LIBRATION POINTS IN THE ELLIPTIC RESTRICTED THREE BODY PROBLEM -U-

AUTHOR--MARKEYEV, A.P.

COUNTRY OF INFO--USSR

SOURCE--PRIKLADNAIA MATEMATIKA I MEKHANIKA, VOL. 34, MAR.-APR. 1970, P. 227-232

DATE PUBLISHED-------70

SUBJECT AREAS--MATHEMATICAL SCIENCES

TOPIC TAGS--TRIANGULATION, DEGREE OF FREEDOM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0867 STEP NO--UR/0040/70/034/000/0227/0232

CIRC ACCESSION NO--AP0136301

UNCLASSIFIED

UNCLASSIFIED

2/2 012 PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136301

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ANALYSIS OF THE STABILITY OF THE EQUILIBRIUM POSITION OF A NONAUTONOMOUS HAMILTONIAN SYSTEM WITH TWO DEGREES OF FREEDOM. A REGION OF PARAMETRIC RESONANCE IS DETERMINED (WITH AN ACCURACY TO THE FIRST DEGREE OF ECCENTRICITY) FOR THE TRIANGULAR LIBRATION POINTS, TOGETHER WITH FORMULAS FOR COMPUTING THE CHARACTERISTIC INDICES, IN WHICH THESE INDICES ARE EXPRESSED THROUGH THE COEFFICIENTS OF THE CHARACTERISTIC EQUATION. THE RESONANCE VALUES OF MU AND E (WITHIN STABILITY REGIONS) FOR WHICH THE TRIANGULAR POINTS CAN BE UNSTABLE ARE DETERMINED.

UNCLASSIFIED

USSR

MARKHYEV, B. M. (Lebedev Physics Institute, USSR Academy of Sciences, Moscow)

"A Theory of Parametric Perturbation of Waves in a Weakly Ionized Plasma"

Leningrad, Zhurnal Tekhnicheskoy Fiziki; February, 1971; pp 259-65

ABSTRACT: The parametric perturbation of electromagnetic oscillations in a hydrodynamic region of frequencies and long waves (ω, $kv_{Te} \ll \nu_{en}$) in a weakly ionized plasma situated in a weak, homogeneous, high-frequency field is studied. The threshold values of the high-frequency field strength for which instabilities can occur in the system are determined; the frequencies and increments of the oscillations which are perturbed are found. It is shown that with frequencies of an external field exceeding the frequency of the colliding electrons the development of electrostatic instabilities in the system is possible. At the other extreme, when the frequency of the external field is less than the frequency of the colliding electrons and neutrals which are unstable in the system, there can be only nonpotential transverse oscillations.

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USSR UDC 533.951.7/.8

GRADOV, O. M., MARKEYEV, B. M.

"Quasilinear Theory of Low-Frequency Instability of a Plasma Placed in a Weak SHF Electrical Field"

Vestn. Mosk. Un-ta. Fiz., Astron. [Moscow University Herald, Physics, Astronomy], Vol 13, No 3, 1972, pp 316-323, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 B191 by L. M. Baltich).

Translation: A quasilinear theory of a plasma with collisions, placed in a weak, homogeneous, superhigh frequency electric field, is developed. It is assumed that the oscillations of electrons $V_E = eE_0/m_e\omega_0$ are slight in comparison with their thermal velocity $V_{Te} = (T_e/m_e)^{1/2}$, i.e., $V_E << V_{Te}$, but frequency ω_0 is near the electron Langmuir frequency $\omega_{Le} = (4\pi e^2 n_e/m_e)^{1/2}$ and significantly greater than the frequency of collisions of charged particles $\nu_{\alpha n}$ (α = e, i). Collisions are considered by means of the Boltzman collision integral. Both quasilinear equations for the distribution function and the corresponding system of equations for moment are produced for cases when the distribution functions are near Maxwellian.

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USSR

UDC 533.951.7/.8

GRADOV, O. M., MARKEYEV, B. M., Vestn. Mosk. Un-ta. Fiz., Astron., Vol 13, No 3, 1972, pp 316-323.

In contrast to the ordinary system of moment equations, the present system of quasilinear equations requires no break for its solution, since, due to averaging, the equation for each moment does not include moments of higher orders. The quasilinear equations produced for a plasma with collisions in a superhigh frequency field are applicable in principle to the study of potential oscillations in a collisionless and strongly ionized plasma as well, and in this sense are general in nature. Conditions of applicability of the theory developed are studied. The dynamics of development of ion-sonic dissipative instability and its influence on the state of the plasma are studied within the framework of the quasilinear approximation. 5 Biblio. Refs.

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USSR

UDC 632.952.02

MARKH, A. T., FEL'DMAN, A. L., and KOBELEVA, S. M., Odessa Technological Institute of the Food Industry imeni M. V. Lomonosov

"The Influence of Tetramethylthiuram Disulfide on the Metabolism and Biosynthesis of Sulfur-Containing Compounds in the Tissues of Potato Tubers"

Moscow, Khimiya v Sel'skom Khozyaystva, Vol 10, No 6, 1972, pp 35-37

Abstract: A laboratory experiment was conducted with Odessa type potatoes on a Knopp culture solution to which had been added .5 microcuries of ^{35}S with a specific activity of 414242 counts/minute. Exposition was for 3 and 6 days. Sulfur-containing compounds were separated with one-dimensional descending chromotography method. The specific activity of the sulfur (a) of the investigated compounds is determined by the exchange rate and the synthesis of the substance during tagging. The rate of synthesis (K) was calculated by the formula:

$$K = \frac{^{35}S}{S} = \frac{a}{a_0 - a}$$

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USSR

MARKH, A. T., et al., Khimiya v Sel'skom Khozyaystva, Vol 10, No 6, 1972, pp 35-37

where ^{35}S is the amount of sulfur included in the investigated compound, in grams; S is the amount of sulfur in the compound up to the time of tagging; a_o is the specific activity of the sulfur ^{35}S in the nutrient culture, in counts/min. per 1 g. The standard deviation of the experiment was calculated by the formula $\pm 0.67 \sqrt{N}$. Correlation of the fractions derived leads to the conclusion that sulfur in $Na_2{}^{35}SO_4$ first enters the mineral part, witnessed by its higher specific activity, then into the organic acid-soluble part, and finally into the albumin part. The variants with TMTD underwent a quicker distribution of the sulfur fractions. Also, the organic acid-soluble and albumin parts gained sulphur at the expense of the mineral part. It was determined that TMTD speeded the process of sulfate restoration and the intensity of biosynthesis of organic biologically active sulfur-containing compounds. TMTD also preserved thiamin from oxidization.

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1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--EFFECT OF HEAT TREATMENT ON THE SUSCEPTIBILITY OF GREEN PEA PROTEINS TO PROTEOLYTIC ENZYMES -U-
AUTHOR-(02)-MARKH, A.T., ZAGIBALOV, A.F.

COUNTRY OF INFO--USSR

SOURCE--KONSERV. OVOSHCHESUSH. PROM. 1970, 25(3), 37-8

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HEAT EFFECT, PROTEIN, PLANT PHYSIOLOGY, ENZYME, FOOD CANNING, FOOD PRESERVATION, FREEZING, LEGUME CROP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605008/E02 STEP NO--UR/9084/70/025/003/0037/0038

CIRC ACCESSION NO--AP0139991
UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139991

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AFTER 6 HR OF DISSOCN. OF FRESHLY FROZEN PEAS, 106-21 MG-G PROTEIN WAS HYDROLYZED; THE AMT. WAS SMALLER FOR CANNED PEAS. FACILITY: ODESS. TEKHNOL. INST. IM. LOMONOSOVA, ODESSA, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--CHANGE IN THE PROTEINS OF GREEN PEAS DURING FREEZING AND FROZEN STORAGE -U-

AUTHOR-(02)-MARKH, A.T., ZAGIBALOV, A.F.

COUNTRY OF INFO--USSR

SOURCE--RHOLOD. TEKH. 1970, 47(2), 47-50

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PROTEIN, FREEZING, VEGETABLE CROP, FOOD STORAGE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0765 STEP NO--UR/0066/70/047/002/0047/0050

CIRC ACCESSION NO--AP0137818

UNCLASSIFIED

1.5-2.0 FOLD, AND THE SOLY. OF GLOBULIN AND ALBUMIN FRACTIONS DECREASED CONSIDERABLY. DURING THE STORAGE OF THE BLANCHED FROZEN PEAS, THE GLUTELIN CONTENT INCREASED, AND GLOBULIN AND ALBUMIN CONTENTS DECREASED CONSIDERABLY. FACILITY: ODESS. TEKHNOL. INST. PISHCH. KHOLOD. PROM., ODESSA, USSR.

UNCLASSIFIED

USSR UDC: 534

MARKHASHOV, L. M.

"Analytic Equivalence of Second-Order Systems in Arbitrary Resonance"

Moscow, Prikladnaya matematika i mekhanika, vol 36, No 6, 1972, pp 1030-1042

Abstract: The following set of second-order differential equation systems is considered:

$$dx_1/dt = n_1x_1 + f_1(c,x_1,x_2)$$

$$dx_2/dt = -n_2x_2 + f_2(c,x_1,x_2),$$

where n_1, n_2 are simple, mutually fixed natural numbers; f_1, f_2 are real functions, analytical in the neighborhood of the point $x \equiv \{x_1,x_2\} = 0$ with expansions having no linear terms; $c = \{c_1,c_2,...\}$ is an ordered set of coefficients in these expansions; finally, each of the above systems of equations relates to some point $c \in R$. The systems $c' \in R$ and $c'' \in R$ are defined to be analytically equivalent if there exists an analytic homeomorphism

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USSR UDC: 534

MARKHASHOV, L. M., Prikladnaya matematika i mekhanika, vol 36, No 6, 1972, pp 1030-1042

in the neighborhood of the point x = 0 which transforms these systems into each other. The problem examined by this paper is to find the necessary and sufficient conditions for the equivalence of the systems of equations above in accordance with this definition.

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USSR UDC: 51:621.391

MARKHASIN, A. B.

"Evaluating the Total Entropy of a System of Discrete Sources of Information"

V sb. Teoriya i praktika ispol'z. sredstv tekhn. kibernetiki. Kn. 1 (Theory and Practice in Using Facilities of Technical Cybernetics--collection of works, Book 1), Novosibirsk, 1970 (1971), pp 73-78 (from RZh--Kibernetika, No 7, Jul 71, Abstract No 7V569)

Translation: Let $\xi=(\xi^{(1)}, \xi^{(2)}, \ldots, \xi^{(m)})$ be a system of m discrete mutually independent sources $\xi^{(l)}=\{\xi_t^{(l)};\ t\in[0, \tau]\}$ with phase space $\{x_1^{(l)}, x_2^{(l)}, \ldots, x_{n_l}^{(l)}\}$. Let κ_l be the number of changes in the source $\xi^{(l)}$; $p_l(x_j^{(l)})$ be the initial distribution of probabilities of the source, $x(\kappa_l)=(x_{j_1}^{(l)}, x_{j_2}^{(l)}, \ldots, x_{j_{\kappa_l}}^{(l)})$ be the vector of states of the source, $\pi_t(x_l(k_l))$ be the conditional probability of the vector of states $x_l(k_l)$ under condition that the initial state is $x_j^{(l)}$ and $\kappa_l=k_l$, $v_{kl}(\tau)=P\{\kappa_l=k\}$. The author considers the entropy of the

MARKHASIN, A. B., Teoriya i praktika ispol'z. sredstv tekhn. kibernetiki. Kn. 1, Novosibirsk, 1970 (1971), pp 73-78

vector of states of the source $\xi(\tau)$

$$H_{l\tau}(\xi) = -\sum_{l=1}^{n_l} p_l(x_l^{(l)}) \sum_{k,j} \pi_e(x_j(k)) v_{kl}(\tau) \log \pi_e(x_j(k)) v_{kl}(\tau).$$

It is shown that

$$H_{l\tau}(\xi) < -\sum_{k=0}^{\infty} v_{kl}(\tau) \log \frac{v_{kl}(\tau)}{(n_l-1)^k}.$$

This estimate is studied in the case where distribution $v_{kl}(\tau)$ is Poisson distribution. It is also proved that under the condition

$$\sum_{k=1}^{\infty} k v_{kl}(\tau) = M_l$$

the estimate

$$H_{l\tau}(\xi) < M_l \log \frac{n_l - 1}{M_l} + (1 + M_l) \log (1 + M_l).$$

2/3

MARKHASIN, A. B., Teoriya i praktika ispol'z. sredstv tekhn. Kibernetiki. Kn. 1, Novosibirsk, 1970 (1971), pp 73-78

is valid. The resultant estimates are used for evaluating the entropy $H_\tau(\xi)$ of the system of sources ξ. Yu. Lin'kov.

USSR UDC 519.21

MARKHASIN, A. B., BOLLER, B. V.

"The Distribution of Time Intervals Between Intersections of Two Levels by a Random Process"

Vopr. Teorii Perdachi Inform. Pri Upr. Proiz-vom [Problems of the Theory of Information Transmission During Production Control -- Collection of Works], Novosibirsk, 1970, pp 10-15 (No 2038-70 Dep) (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V93 by the authors).

Translation: Distributions of lengths of sectors between points of intersection of two levels with opposite signs of the levels and derivitives by normal noise are produced.

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UDC 519.21

USSR

MARKHASIN, A. B.

"Properties of One Class of Unstable Random Streams with After Effect"

Bol'shiye Sistemy. Massovoye Obsluzh. Nadezhnost' [Large Systems. Queueing. Reliability -- Collection of Works], Moscow, Nauka Press, 1970, pp 326-337 (Translated from Referativnyy Zhurnal Kibernetika, No 3, 1971, Abstract No 3 V74 by B. Kharlamov).

Translation: Random stream X is studied, which is a superposition of m (m=1,2,...) independent random streams X_s(s=1,2,...,m), the parameters of which λ_s are random processes with instantaneous distribution functions which are constant in time: $F_s(\lambda) = P(\lambda_s(t) < \lambda)$ $(-\infty < t < \infty;\ s = 1, 2, \ldots, m;\ \lambda > 0)$. The intensity of stream X is finite and the component streams X_s are evenly limited in intensity. Certain sufficient conditions are presented that the interval distributions of stream X approaches the distributions of a stable Poisson stream as $m \to \infty$.

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UDC 519.214

USSR

MARKHASIN, A. B.

"Proof of Poisson's Theorem for a Generalized Binomial Probability Distribution Rule"

Vopr. Teorii Perdachi Inform. Pri Upr. Proiz-vom [Problems of the Theory of Information Transmission During Production Control -- Collection of Works], Novosibirsk, 1970, pp 23-25 (No 2038-70 Dep) (Translated from Referativnyy Zhurnal Kibernetika, No 4, April, 1971, Abstract No 4 V23 Dep by the author).

Translation: Poisson's theorem is proven for a generalized binomial probability distribution rule with various probabilities of results of experiments in a series.

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UNCLASSIFIED PROCESSING DATE--13NOV70

1/2 021

TITLE--INFRARED ABSORPTION SPECTRA OF 1,2,PROPYLENEDIAMINE COMPLEXES OF THALLIUM,III -U-

AUTHOR-(04)-KULBA, F.YA., MAKASHEV, YU.A., MARKHAYEVA, D.M., BARSUKOV, A.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(4), 983-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--IR SPECTRUM, PROPYLENE, DIAMINE, THALLIUM COMPOUND, COMPLEX COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1215 STEP NO--UR/0078/70/015/004/0983/0987

CIRC ACCESSION NO--AP0128633
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70

2/2 021
CIRC ACCESSION NO--AP0128633
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IR SPECTRA OF TL(PN) SUBN X SUB3 (WHERE PN EQUALS 1,2,PROPYLENEDIAMINE, N EQUALS 1, 2, OR 3, AND X EQUALS CL, BR), TI(PN) SUB2 I SUB3, AND TL(PN SUB3 (NO SUB3) SUB3 WERE DETD. AND ASSIGNMENT OF THEIR MAX. ARE GIVEN. SPECTRA OF (TL(PN) SUB3) PRIME3 POSITIVE ARE VERY SIMILAR TO THE SPECTRA OF ZN(EN) SUB3 CL SUB2 AND CO(EN) SUB3 CL SUB2; IT IS ASSUMED THAT IN THESE COMPLEXES, PN HAS THE GAUCHE CONFIGURATION. MONO AND BIS-PN COMPLEXES HAVE SIMPLER SPECTRA OWING TO CHAINLIKE STRUCTURE WITH TRANS COORDINATED PN BRIDGES.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

1/2 013

TITLE--INCREASE IN THE ADHESIVE PROPERTIES OF BRAND V BLACK PORGUS SOLE RUBBERS -U-

AUTHOR-(05)-GUDIMENKO, V.I., PUSHKOVA, V.V., SANDLER, G.A., KUZNETSOVA, V.A., MARKICHEVA, N.V.

COUNTRY OF INFO--USSR

SOURCE--KOZH.-OBUV. PROM. 1970, 12(5), 47-51

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, MILITARY SCIENCES

TOPIC TAGS--RUBBER, VULCANIZATION, ADHESION, FOOTGEAR/(U)101K RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED.
PROXY FICHE NO----FD70/605012/006 STEP NO--UR/0498/70/012/005/0047/0051

CIRC ACCESSION NO--AP0140292
UNCLASSIFIED.

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 013
CIRC ACCESSION NO--AP0140292
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT CONST. RUBBER COMPN. THE ADHESION OF POROUS SOLE RUBBER TO CLOTH INCREASED WITH ITS D. THE D. WAS VARIED BY CHANGING THE RELATIVE VULCANIZATION TIMES AT LOW AND HIGH PRESSURES WHILE MAINTAINING THE TOTAL VULCANIZATION TIME CONST. ALTERNATIVELY, THE D. WAS VARIED BY CHANGING THE AMT. OF THE BLOWING AGENT (DINITROSOPENTAMETHYLENETETRAMINE). THE ADDNS. OF RESIN (OLK, RESOTROPIN, OR RESORCINOL TO THE STD. RUBBER MIXES INCREASED THEIR ADHESION TO CLOTH 20-60PERCENT WITHOUT IMPAIRING OTHER PROPERTIES.

UNCLASSIFIED

USSR

UDC 621.375.82

BYKOVSKIY, YU. A., LARKIN, A. I., LEBEDEV, YU. S., and MARKILOV, A. A.

"Holographic Broadening of Optical Spectra"

Moscow, V sb. Kvant. elektronika (Quantum Electronics -- collection of works), "Sov. radio," No 1(13), pp 109-111 (from RZh-Fizika, No 7, 1973, Abstract No 7D1117)

Translation: The method of optically matched filtrations is used for the recognition and broadening of optical spectra. A method of changing the form of a recognized spectrum is proposed for localizing the correlation signal and broadening the range of the space frequencies fixed in the filter. The experimental results of the recognition of the models of complex spectra are given. Authors' abstract.

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USSR

UDC 612.76+612.013.7]-053.7

SARKISYANTS, E. E., DOSKIN, V. A., MINNIBAYEV, T. Sh., and MARKIN, A. A., Chair of Hygiene of Children and Adolescents, First Moscow Medical Institute imeni I. M. Sechenov

"Motor Activity and Daily Energy Expenditure of Students"

Moscow, Gigiyena i Sanitariya, No 11, 1972, pp 56-59

Abstract: Questionnaires and time-and-motion studies were used to analyze the daily routine of over 600 young men and women attending the First Moscow Medical Institute and Moscow Energy Institute. The students were relatively inactive 83% of the time, even during their leisure hours, which they spent mostly reading, watching television, or going to the movies. Only about 7% of all the students engaged in sports of any kind. The women were even less active than the men, the energy expenditure averaging 2290 and 3536 kcal, respectively. The students housed in dormitories tended to be more passive than those living at home. All students, male and female, became more active on Sundays possibly because the body's natural need of exercise is curbed on school days.

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USSR

UDC: 621.373.826

MARKIN, A. S.

"Discrimination of Modes of Waveforms, and the Effect of Self-Synchronization in a Solid-State Laser With Translucent Filter"

Tr. fiz. in-ta AN SSSR (Works of the Physics Institute of the Academy of Sciences of the USSR), 1971, 56, pp 3-65 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3D224)

Translation: The paper presents results on Q-switching a neodymium glass laser by using a translucent filter, and a quantitative comparison is made between the time characteristics obtained for a giant pulse as a function of the coefficient of population inversion, and the theory of an ideal gate. An experimental study is done on the spectral composition of neodymium glass and ruby laser emission with various modes of emission, as well as the effect which the selective properties of various cavity elements have on spectral composition. Single-mode emission is achieved in a neodymium glass laser with translucent filter. The results, which show strong dependence of the width and structure of the laser emission spectrum on the properties of the cavity are discussed on the basis of the specifics of

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MARKIN, A. S., Tr. fiz. in-ta AN SSSR, 1971, 56, pp 3-65

emission pulse development under various conditions. A study is made of the mode of a laser with translucent filter where individual modes are phase-synchronized -- self-synchronization of modes. Conclusions drawn from a study of the nature of self-synchronization due to filter position in the cavity agree satisfactorily with theory. On the basis of an investigation of the spectral distribution of the intensity of a laser with translucent filter, estimates are made of the limiting duration of ultrashort pulses which are possible in lasers of this type. Forty-two illustrations, three tables, bibliography of 106 titles. Resumé.

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1/2 040 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--BRANCHING REACTIONS AND CHEMICAL LASERS -U-

AUTHOR-(05)-BASOV, N.G., MARKIN, E.P., NIKITIN, A.I., ORAEVSKY, A.N., LEBEDEV, P.N.
COUNTRY OF INFO--USSR, UNITED STATES

SOURCE--IEEE J. QUANTUM ELECTRONICS, USA, VOL. QE-6, NO. 3, P. 183-4, MARCH 1970, SECOND CONFERENCE ON CHEMICAL AND MOLECULAR LASERS. DIGEST.
DATE PUBLISHED----MAR70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--CHEMICAL REACTION, HYDROGEN, FLUORINE, AMMONIA, CARBON DIOXIDE, CHEMICAL LASER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0075 STEP NO--US/0000/70/000/003/0183/0184

CIRC ACCESSION NO--AT0123847
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--23OCT70

2/2 040

CIRC ACCESSION NO--AT0123847

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ABSTRACT ONLY GIVEN, SUBSTANTIALLY AS FOLLOWS. THE AUTHORS DISCUSS THE PECULIARITIES OF POPULATION INVERSION WHICH OCCUR IN BRANCHED CHEMICAL REACTIONS AND EXPERIMENTAL RESULTS OBTAINED WITH MIXTURES H SUB2 PLUS F SUB2 AND HN SUB3 PLUS CO SUB2. FACILITY: PHYS. INST., MOSCOW, USSR.

UNCLASSIFIED

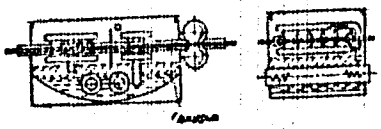
USSR UDC: 621.3.049.75

MARKIN, N. I., SHCHERBAKOV, L. U., SOLOV'YEV, V. I., SADOVNIKOV, I. T.

"A Method of Coating Two-Sided Printed-Circuit Boards with Solder"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 10, Apr 71, Author's Certificate No 298089, Division H, filed 29 Jun 68, published 11 Mar 71, p 198

Translation: This Author's Certificate introduces a method of coating two-sided printed-circuit boards with solder in an inert gas atmosphere. As a distinguishing feature of the patent, the process is mechanized and the quality of the coating is improved by jet-spraying both sides of the board with low-melting solder as it moves continuously in the tank, followed by jet-spray rinsing of the excess solder in glycerin.



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MARKIN P.M.

Acc. Nr.: AN0104123 Ref. Code: UR9003

TITLE-- ANNOUNCEMENT OF THE COMMITTEE ON LENIN AND STATE PRIZES, U.S.S.R.

NEWSPAPER-- IZVESTIYA, MAY 28, 1970, P 4, COLS 1-5

ABSTRACT-- NINETY ONE BASIC AND APPLIED RESEARCH WORKS HAVE BEEN NOMINATED FOR THE STATE PRIZES. TWO OF THESE, "THE MULTI-PURPOSE INDUSTRIAL HELICOPTER KA-26", BY N. I. KAMOV, V. B. ALPEROVICH, V. B. BARSHEVSKIY, A. A. DMITRIYEV, G. I. IOFFE, M. A. KUPFER, L. A. POTASHNIK, N. N. PRIOROV, A. G. SATAROV, I. M. VEDENEYEV, S. B. BREN, AND V. A. NAZAROV, AND "THE DEVELOPMENT OF TURBOFAN JET ENGINES NK-8 AND NK-8-4, AND THE DEVELOPMENT AND REDUCTION TO SERIAL PRODUCTION A SYSTEM OF TECHNOLOGICAL PROCESSES WHICH ASSURED WIDE USES FOR TITANIUM ALLOYS", BY N. D. KUZNETSOV, M. T. VASILISHIN, V. A. KURGANOV, P. M. MARKIN, V. D. RADCHENKO, P. A. SUKHOV, A. A. MUKHIN, V. G. SHITOV, G. I. MUSHENKO, L. A. SHKODO, AND G. P. DOLGOLENKO, HAVE BEEN SUBMITTED BY THE MINISTRY OF THE AVIATION INDUSTRY.

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19870555

Acc. Nr.: AN0104123

"A SERIES OF INVESTIGATIONS INTO THE DYNAMICS OF A BODY WITH FLUID-FILLED CAVITIES", /65-68/, BY N. N. MOISEYEV, A. A. PETROV, V. V. RUMYANTSEV AND F. L. CHERNOUS'KO AND "ULTRA HIGH PRECISION JIG BORING MILLS WITH 1,000 X 1,600 AND 1,400 X 2,240 MM PLATENS", BY A. I. KIR'YANOV, V. G. ABRAMOVICH, I. V. GUTKIN, A. S. ALIMPIYEV, G. B. PAUKOV, AND A. S. YEGUDKIN, HAVE BEEN SUBMITTED BY THE COMPUTATION CENTER OF THE ACADEMY OF SCIENCES AND THE MINISTRY OF THE MACHINE TOOL CONSTRUCTION AND TOOL INDUSTRY, RESPECTIVELY.

"THE RADICALLY IMPROVED MELTING TECHNOLOGY OF CRITICAL-PURPOSE HIGH-ALLOY STEELS AND ALLOYS OF IMPROVED QUALITY ACHIEVED BY THE INERT GAS TREATMENT OUTSIDE THE FURNACE", BY YU. V. GENASIMOV, O. M. CHEKHOMOV, N. V. SIDOROV, S. K. FILATOV, B. A. CHEREMNYKH, R. M. KHAYRUTDINOV, I. P. BARMOTIN, L. K. KOSYREV, K. P. BAKANOV, N. N. VLASOV, P. I. MELIKHOV, AND N. A. TULIN, HAS BEEN SUBMITTED BY THE ZLATOUST METALLURGICAL PLANT.

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UDC 615.214.2.915:612.825.266

KROLEVETS, G. N., and MARKIN, V. A., Laboratory of Nervous System Pharmacology, Institute of Pharmacology, Academy of Medical Sciences USSR, Moscow

"Electrophysiological and Histochemical Studies of the Effects of Neuroleptics on the Hippocampus"

Moscow, Farmakologiya i Toksikologiya, Vol 36, No 2, 1973, pp 146-149

Abstract: The effects of chlorpromazine (I) and trifluoperazine (II) on the hippocampus were studied electrophysiologically in rabbits and histochemically in rats. Investigations with unanesthetized and curare-treated rabbits that had received 1-5 mg/kg of I or II intravenously, showed that with both drugs the amplitude of hippocampal electrical activity increased by 60-100% at the time of the maximum response (20-60 min following drug administration), and had returned to initial levels by 2.5-3 h. Similar alterations in electrical activity were seen in the transcommissural response. Under the influence of I, stimulation of the sciatic nerve did not change, or changed insignificantly, the electrical activity. I and II differed with respect to hippocampal background electrical activity, in that I showed a greater synchronizing effect, and II frequently elicited spontaneous convulsive-like episodes. Histochemical studies were conducted on 135 white male rats (180-200 g) given one subcutaneous

1/2

USSR

KROLEVETS, G. N. and MARKIN, V. A., Farmakologiya i Toksikologiya, Vol 36, No 2, 1973, pp 146-149

injection of 1, 5, or 20 mg/kg of I or II, and decapitated 1,3, and 24 h later. The results showed that 5 and 20 mg doses of I or II significantly depressed activities of the flavin enzymes (DPN- and TPN-diaphorases and succinate dehydrogenase) and the pyridine dehydrogenases (lactic, isocitric, malic, glutamate, and alpha-glycerophosphate); the inhibiting effects on the former group were somewhat more pronounced. Furthermore, glucose-6-phosphate dehydrogenase was either unaffected or slightly elevated following treatment of the rats with I or II. In addition, II depressed hippocampal enzyme activity somewhat more than I did. The changes were most pronounced in the anterior hippocampus, and hardly evident in the posterior hippocampus. The layers most affected were II (Oriens) and IV (Rudiata). Maximum enzyme depression was apparent at 3 h, and by 24 h had been partially restored. These observations indicate the importance of metabolic and electrical changes in the hippocampus in the pharmacologic effects of I and II.

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UDC 620.17:669.27'71'295'296

KLYPIN, B. A., MANEGIN, Yu. V., MARKIN, V. G., and FEDOROV, Yu. K., Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Technological and Mechanical Properties of Some Tungsten Alloys"

Moscow, Metallovedeniye, No 6, 1971, pp 44-47

Abstract: Mechanical and technological properties of tungsten alloys containing W-0.5% Ti, W-10% Mo-0.5% Ti, and W-0.5% Ti-0.1% Zr, vacuum smelted in an arc furnace with consumable electrode, were investigated on pressed, forged, and rolled bars. Highest quality bars were obtained by use of dies covered with Al_2O_3 and by a drawing rate of not less than 4. Introduction of 10% Mo into the alloy W-0.5% Ti at temperatures up to 2000°C increases its strength and improves its macrostructure and the quality of the ingot. Introduction of 0.1% Zr into the alloy W-0.5% Ti sharply increases the recrystallization temperature and the hardness of the alloy at 1500-1700° C which hinders its deformation. Effects of drawing (1600-1640° C) on the specific pressure and of the temperature on mechanical properties and the dependence of hardness on the annealing temperature are shown. Four figures, six bibliographic references.

1/1

Nickel

USSR UDC 621.77.04:669.14.001.6

TEYMER, D. A., MARKIN, V. G., AFONINA, V. M., and RYBAKOV, P. P.

"Manufacture of Thin Strip of High-Purity Nickel-Molybdenum Alloy"

Spetsial'nyye Stali i Splavy [Special Steels and Alloys--Collection of Works], No 77, Metallurgiya Press, 1970, pp 233-237

Translation: A technology of melting is developed, providing production of NIMO-20A nickel-molybdenum alloy of high purity (as concerns content of impurities and gases). It is established that the most favorable technology is deoxidation of the liquid bath with carbon alone. A technology is developed for production of cold rolled strip 0.010-0.015 mm thick of NIMO-20A alloy. 1 figure; 1 table.

1/1

USSR UDC 577.37

CHUZMADZHEV, YU. A., MULER, A. L., and MARKIN, V. S., Institute of Electrochemistry

"Conformation Model of Excitable Cell Membranes. I. Ionic Permeability"

Moscow, Biofizika, No 6, 1972, pp 1,012-1,016

Abstract: The authors propose a model of a cell membrane consisting of globular lipoproteins forming a dimeric lattice. The model shows the relationship between membrane conductivity and concentration of bivalent ions in an external solution and the membrane potential. This relationship satisfactorily explains the steep increase in sodium conduction from the potential g_{Na} (φ) and the shift of the curve g_{Na} (φ) to the right along the axis of the potentials when the concentration of Ca^{++} in the external solution is increased. The model is in good quantitative agreement with the experimental data.

1/1

USSR

MARKIN, V. S., GRIFOR'YEV, P. A., and YERMISHKIN, L. N., Institute of Electrochemistry, Academy of Sciences USSR, Moscow, and Institute of Biological Physics, Academy of Sciences USSR, Pushchino

"Direct Passage of Ions Through Lipid Membranes. I. . Mathematical Model"

Moscow, Biofizika, Vol 16, No 6, Nov/Dec 71, pp 1,011-1,018

Abstract: A mathematical model containing seven parameters -- constant of ion diffusion into the membrane, constant of ion diffusion out of the membrane, saltatory velocity of ions jumping from one potential pore in the membrane to another, pore width coefficient, surface capacitance, volume capacitance, and saturation concentration -- is established. The parameters are measured under the given experimental conditions, and the figures are substituted into the model to calculate the permeability of a lipid membrane to any lipid-soluble ions. Equations for volt-ampere curves, admittance, and the coefficient of partition between water and lipid are given. Tests suitable for verifying the theory are suggested.

1/1

USSR

UDC 541.136

CHIZHADZHEV, YU. A., MARKIN, V. S., TARASEVICH, M. R., CHIRKOV, YU. G., Academy of Sciences USSR, Institute of Electrochemistry

Moscow, Makrokinetika Protsessov v Poristykh Sredakh (Macrokinetics of Processes in Porous Media), "Nauka," 1971, 364 pp

Translation of Annotation: The behavior of liquid and gas in porous media is of interest in connection with a variety of problems pertaining to underground hydro- and gas dynamics, mercury porometry, and industrial chemistry. Of special urgency are the investigations of the processes in porous catalysts, where chemical or electrochemical reactions take place against the background of hydrodynamic phenomena. Fuel cells, which are highly promising and are now being intensely developed, making it possible to directly convert chemical energy into electric energy, can serve as an example of such a system.

This book is devoted to the study of the mechanism of current generation in electrochemical generators. It expounds in detail the theory of capillary phenomena in porous media, the theory of

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

hydrodynamic mixing, etc., as well as the basic principles of the action of porous gas electrodes of fuel cells.

The book is intended for physicists, physical chemists, electrical chemists, and engineers interested in the phenomena occurring in porous media. It is of special interest to specialists working in the field of direct conversion of chemical energy into electric energy. This book can be useful to students of upper courses and to graduate students of the appropriate specialties.

Tables: 1. Illustrations: 261. Bibliography: 491 entries.

Table of Contents:

2/9

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

4/9

USSR

CHIZHADZHEV, YU. A., et al, Makrokinetika Protsessov v Pористykh Sredakh, "Nauka," 1971, 364 pp

5/9

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

6/9

USSR

CHIZHADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

8/9

USSR

CHIZMADZHEV, YU. A., et al, Makrokinetika Protsessov v Poristykh Sredakh, "Nauka," 1971, 364 pp

9/9

USSR

LEVICH, V. G., Corresponding Member of the Academy of Sciences USSR;
MAZUR, N. G.; MARKIN, V. S., Institute of Electrochemistry of the Academy of Sciences USSR, Moscow

"Blocking of a Pulse by an Inhomogeneity in an Electrochemical Model of a Nerve"

Moscow, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

Translation: Papers have recently appeared [V. S. Markin, V. F. Pastushenko, Bicfizika, Vol. 13, pp 316 and 517, 1969] devoted to an analytical study of the passage of a nerve pulse along an inhomogeneous fiber in a model with inner current sources [V. S. Markin, Yu. A. Chizmadzhev, Biofizika, Vol. 12, p 900, 1967]. It is of interest to consider a similar problem for different physical models of a nerve fiber, particularly for the Lillie-Bonkheffer model [R. S. Lillie, Biol. Rev. Cambr. Phil. Soc., Vol. 11, p 181, 1936; K. Bonkheffer, Tr. IV soveshch. po elektrokhimii, Izd. AN SSSR, 1959, p 579; G. I. Barenblatt, V. M. Yentov, R. L. Salganik, P.M.M., Vol. 29, p 977, 1965] taking into account

specific physicochemical characteristics. The Lillie model consists of an iron wire in a tube with solid nitric acid. The passage of a pulse along a smooth [V. G. Levich, N. G. Mazur, V. S. Markin, D.A.N., Vol. 198, No. 4, 1971] and a myelinized [V. G. Levich, N. G. Mazur, V. S. Markin, D. A.N., Vol. 195, p 206, 1970] fiber was studied in this model. The motion of an activation pulse in an inhomogeneous Lillie model is investigated below and the results are compared with experimental data [K. Yamagiwa, Japan. Med. J., Vol. 2, p 38, 1949].

1. Abrupt Inhomogeneity

The state of the system is described by the potential $\varphi(x, t)$, the proportion of free to passivating film of oxide of the surface $a(x, t)$ and the concentration $c(x, t)$ of one of the reaction products, nitric acid. In this problem one can neglect the change in the latter quantity and put $c(x, t) = c_0 = \text{const}$, since the change in $c(x, t)$ occurs only in the zone at the far end of the tail (in the repassivation process).

The change in the potential in the portion of the active surface is determined by the equations

2/10

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

$$\partial^2\phi/\partial x^2 + R(j_{Fe} + j_f + j_{acid}) = 0, \qquad (1)$$

$$\partial\alpha/\partial t + 1/Q\, j_f = 0, \qquad (2)$$

where $R = R_1 = \rho\sigma_1/S_1$ for $x < 0$ and $R = R_2 = \rho\sigma_2/S$ for $x > 0$. The letters $\sigma_{1,2}$ and $S_{1,2}$ denote the perimeter of the cross section of the wire and the area of the cross section of the electrolyte in the tube, respectively. In other words it is assumed that the inhomogeneity is localized at the point $x=0$.

Expressions for the equivalent currents of the processes of active solution of iron, breakdown, and the formation of a passivating film and restoration of nitric acid to nitrous have the form (in the linear approximation)

$$j_{Fe} = A(\phi_1 - \phi)\alpha;$$
$$j_f = A\cdot\begin{cases}(\phi_* - \phi)(1-\alpha) & \text{for } \phi > \phi_*,\\ \phi_* - \phi)\alpha & \text{for } \phi < \phi_*,\end{cases} \qquad (3)$$

3/10

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

$$j_{acid} = \begin{cases} 0 & \text{for } \phi = 0, \\ -Jc_0 & \text{for } \phi > 0. \end{cases}$$

The threshold potential ϕ_* is characterized by the fact that for $\phi > \phi_*$ there occurs breakdown on the film and for $\phi < \phi_*$ there is formation on the film.

The purpose of the problem is to explain conditions under which an activation pulse is blocked by an inhomogeneity. This question can be answered by studying stationary states of the system.

One can easily obtain from the condition $\partial\alpha/\partial t = 0$, considering (2) and (3), the general form of the stationary solution: either $\alpha = 0$ and $\phi < \phi_*$ or $\alpha = 1$ and $\phi > \phi_*$. To be specific we shall consider a pulse arriving from the left. In accordance with the condition $c(x, t) = c_0$ (absence of repassivation) it consists of a simple activation wave. It is clear that stationary states of two types can develop from this pulse as $t \to \infty$: either $\alpha \equiv 1$, which corresponds to the passage of the pulse, or

$$\begin{aligned} &\alpha = 1 \text{ for } x < l, \\ &\alpha = 0 \text{ for } x > l, \end{aligned} \qquad (4)$$

4/10

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

which corresponds to blocking (stopping of the front of the pulse at the point $x = l$).

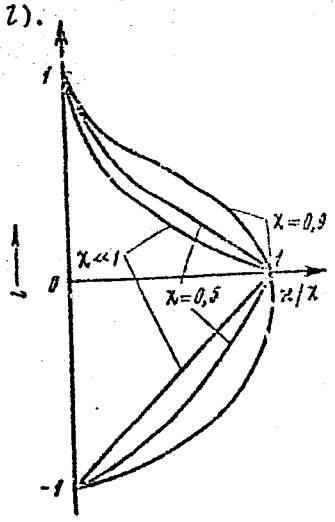

Fig. 1. $l(\kappa)$ as a function of certain values of the parameter χ. For convenience different units of measurement of length (characteristic for each region) were chosen for $l > 0$ and $l < 0$.

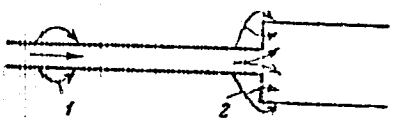

Fig. 2

Fig. 2. Local currents in an activation pulse. 1--front of pulse far from junction, 2--front of pulse in region of junction.

5/ 10

Fig. 1

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

The method of solution of the problem is the following. If α is substituted into equation (1) in form (4), a linear equation is obtained with a piecewise-constant coefficient. Besides the condition of boundedness of ϕ and continuity together with the first derivative distinguishing a solution of this equation for any l, there is also the condition $\phi(l) = \phi_*$. This "extraneous" condition determines l as a function of the parameters of the problem. The corresponding formulas are fairly unwieldy and therefore it is convenient to express this relationship graphically. Fig. 1 shows the graph l as a function of the geometric parameter $\kappa = \sigma_1 S_1/\sigma_2 S_2$ for several values of the refractoriness parameter $\chi = 2A\phi_* Jc_0/[A(\phi_1 - \phi_*) - Jc_0]^2$, which under actual conditions is much less than unity. For simplicity it may be assumed that the tube with the acid is much thicker than the wire so that $S_1/S_2 \approx 1$. Then κ will be simply the ratio of the diameter of the wire to the left of the inhomogeneity to its diameter to the right of the inhomogeneity.

6/10

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

It is evident from Fig. 1 that for $\kappa > \chi$ the point $l(\kappa)$ does not exist, i.e., the pulse will pass the inhomogeneity. On the contrary, for $\kappa < \chi$, i.e., when the right side of the wire is a sufficient number of times thicker than the left, two values of $l(\kappa)$ exist: $l_- < 0$ and $l_+ > 0$. It can be shown that the pulse stops at l_- without reaching the junction of the thin and thick wires. This is associated with the fact that the stationary state with $l = l_-$ is stable and unstable with $l = l_+$.

The blocking of a pulse is explained physically by the fact that as it approaches the inhomogeneity the subthreshold zone creeps up on the thicker wire and the use of current rises in it since the current is needed to be distributed over the larger area. At the same time, the activation zone in the thin wire generates a fixed activating current (Fig. 2). The activating current may not be enough for a sufficient difference in the diameters and the pulse will stop.

7/10

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71

2. Inhomogeneity With an Electrochemically Inert Interval

Under actual conditions the parameter χ is of the order 10^{-4}. Blocking will therefore be observed if one of the halves of the wire is tens of thousands of times thicker than the other, i.e., under actual conditions it is practically impossible to observe this effect. A one-sided conductivity is observed in a somewhat modified system, however, namely if the junction point is covered with an insulator. Fig. 3 shows a model of a synapse from the work of Yamagiwa consisting of a long wire to which is fastened a bunch of several short wires. One of the ends of the bunch is filled with paraffin. The discussions of the previous point are applicable to the theoretical calculation of this model with the only difference that in the interval $(0, h)$ one should put $j_{Fe} + j_f + j_{acid} = 0$. This interval corresponds to the part of the wire covered with paraffin. Curves $l(\kappa)$ analogous to the curves for Fig. 1 are obtained as a result of the calculation. Now, however, the maximum value of κ at which blocking is still possible is a function of h:

$$\kappa_{cr} = \chi(1 + h\sqrt{R_1 A})^2. \qquad (5)$$

It is evident from this formula that the blocking action of the inhomogeneity rapidly decreases with an increase in the inert interval. Since the characteristic length $(R_1 A)^{-1/2}$ for wires ordinarily used is a value of the order of

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

0.1 cm, values of κ_{cr} slightly less than unity are obtained in the presence of an inert segment with a length of several centimeters. In the system shown in Fig. 3, therefore, there is observed blocking of the pulse moving from the left even for a small number of wires in the bunch.

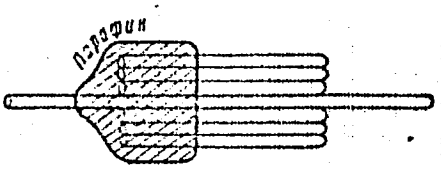

Рис. 3

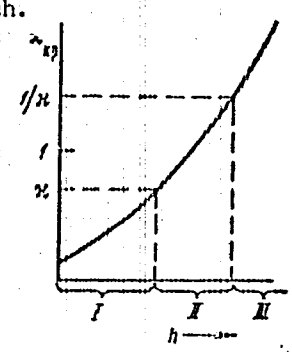

Рис. 4

9/10

Рис. 3. Система с односторонним проведением из работы [8]

Рис. 4. Зависимость критического отношения толщин от h и области двух- и односторонней проводимости и отсутствия проводимости

USSR

LEVICH, V. G., et al, Doklady Akademii nauk SSSR, Vol. 198, No. 5, 11 Jun 71, pp 1214-1216

With the aid of the graph of relationship (5) shown in Fig. 4, it is easy to construct the region of values h corresponding to a two-sided (region I) and one-sided (region II) conductivity and also to the absence of conductivity (region III). It is sufficient to take into account here that the quantity κ is replaced by $1/\kappa$ for a pulse coming from the right.

10/10

USSR UDC 577.37

CHIZMADZHEV, Yu. A., MARKIN, V. S., and KUKLIN, R. N., Institute of Electrochemistry, Academy of Sciences USSR, Moscow

"Relay-Race Transfer of Ions Through Membranes. II. Alternating Current"

Moscow, Biofizika, Vol 16, No 3, May/Jun 71, pp 437-442

Abstract: By applying the relay-race model of ion transfer, passage of an alternating current through an artificial bimolecular phospholipid membrane upon addition of inhibitors of oxidative phosphorylation is considered. The same assumptions in regard to the membrane and the uncouplers are made as those in a preceding study by the authors of the passage of a direct current (Biofizika, Vol 16, No 2, 1971). Relationships between impedance of the membrane and the effects of pH and frequency on capacitance and conductance are derived. The transfer current upon rapid fixation of the potential on the membrane is calculated. The results show that on assumption of an alternating current the relay-race model leads to electrochemical properties of the membrane that differ from those obtained on the basis of a mobile carrier model, whereas the properties of the membrane are the same for either model if a direct current is assumed. One can therefore determine, by carrying out measurements with an alternating current, which of the two mechanisms corresponding to the theoretical models of ion transfer is actually applicable.
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USSR UDC 541.13

MARKIN, V. S., PASTUSHENKO, V. F., and CHIZMADZHEV, Yu. A., Institute of Electrochemistry, Academy of Sciences US$R

"Propagation of a Pulse in the Electrokinetic Model of Nerve Fiber"

Moscow, Elektrokhimiya, No 3, Mar 71, pp 337-345

Abstract: Electrochemical systems with N-shaped current-voltage characteristics attract much research, since they enable one to model the generation processes and the propagation of nerve impulses. This article considers an electroosmotic system which displays localized drop in the current-voltage characteristics. The model system consisted of a two compartment electrolytic cell separated by a membrane and containing two solutions of different concentrations on the two sides of the membrane. The membrane was polarized by a segmented electrode located some distance away from the membrane in solution of lower concentration. In the experiment a constant current density j_0 is imposed upon this segmented electrode. It was found that propagation of the signal is determined not only by the properties of the membrane, but also by the nature of the distribution of the potential along the membrane. Equations were derived which describe the profile of

1/2

USSR

MARKIN, V. S., et al., Elektrokhimiya, No 3, Mar 71, pp 337-345

the potential along the membrane and changes of the concentration of the electrolyte inside the membrane. Calculations are given for the rate of the propagation of the potential step along the membrane as a function of the parameters of the electroosmotic cell. The rate of propagation of the signal is dependent on the polarization current and has the shape of semiparabolas of different radius of curvature. From the formulae describing the rate of propagation of the impulse it is apparent that in the discrete membrane system, which is analogous to myelinized fiber, impulses propagated more rapidly than in the uniform membrane. In the membrane consisting of small segments which are separated by short intervals of the local current density on the active segments of the membrane remain constant then the increase of the resistance of the membrane r by a factor of α decreases the current density per unit length of the membrane by a factor of α. Substituting changes of the current and resistance into derived equations one finds that the rate of the propagation of the signal is increased by a factor of $\alpha^{1/2}$.

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1/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--ELECTRICAL INTERACTION OF PARALLEL UNMYELINIZED NERVE FIBERS. I. CHANGE OF ADJACENT FIBER EXCITABILITY -U-

AUTHOR--MARKIN, V.S.

M

COUNTRY OF INFO--USSR

SOURCE--BIOFIZIKA 15(1): 120-129. ILLUS. 1970

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--NERVOUS SYSTEM, BIOELECTRIC PHENOMENON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO-----FD70/605008/B03 STEP NO--UR/0217/70/015/001/0120/0129

CIRC ACCESSION NO--AP0139935

UNCLASSIFIED

2/2 021 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139935

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONDUCTION OF NERVE IMPULSES ALONG ADJACENT FIBERS IS WASHED BY A LIMITED VOLUME OF CONDUCTING LIQUID. THE EQUATIONS SYSTEM FOR MEMBRANE POTENTIAL DIFFERENCES IS DEDUCED AND SOLVED. FOR EACH FIBER THERE ARE 2 STATIONARY SOLUTIONS CORRESPONDING TO THE IMPULSES PROPAGATING WITH VARIOUS RATES. ONE OF THESE IMPULSES IS STABLE, THE OTHER UNSTABLE. THE CASE IS ANALYZED WHEN THE NERVE IMPULSE PROPAGATES ONLY ALONG 1 OF THE FIBERS, THE 2ND 1 REMAINING PASSIVE. AS THIS TAKES PLACE ALONG THE 2ND FIBER THERE PROPAGATES THE WAVE OF MEMBRANE POTENTIAL CHANGE; THE FIBER IS HYPERPOLARIZED, THEN DEPOLARIZED, AND AT LAST AGAIN HYPERPOLARIZED. THUS, THE EXCITABILITY THRESHOLD OF THE 2ND FIBER IS AT 1ST INCREASED, THEN DECREASED AND FINALLY INCREASED. SUCH A CHANGE OF EXCITABILITY WAS OBSERVED BY KATZ ET. AL. THE CONDITIONS IN THE 2ND REGION AGE ANALYZED WHEN THE EXCITABILITY THRESHOLD IS DECREASED. IF IT FALLS UP TO ZERO, THE SPONTANEOUS EXCITATION OF THE FIBER TAKES PLACE. THE ANALYSIS SHOWED THAT SUCH AN EXCITATION IS PRACTICALLY IMPOSSIBLE UNDER NORMAL CONDITIONS. IT CAN PROCESS ONLY WHEN THE EXCITABILITY OF THE 2ND FIBER IS ARTIFICIALLY DECREASED. E.G., BY DAMAGE OR CHEMICALS.

FACILITY: INST. ELECTROCHEM., ACAD. SCI. USSR, MOSCOW, USSR.

UNCLASSIFIED

garded as resulting from the direct passage of T particles, stagewise jumps of A ions, and transport of A during the action of carrier membranes. In the membrane, T and L ions can lie only on the boundary in certain potential wells, and only one ion can be present in each well (ions can enter wells only on the condition that the wells are vacant). Additionally, T and L ions may shift from wells at the left margin to the opposite well on the right boundary, provided the shift is to a vacant well.

Biophysics

USSR UDC 577.37

AYT'YAN, S. Kh., LEVICH, V. G., Corresponding Member, Academy of Sciences USSR, MARKIN, V. S., and CHIZMADZHEV, Yu. A., Institute of Electrochemistry, Academy of Sciences USSR, Moscow

"Generalized Model of Ion Transport Through Artificial Phospholipid Membranes"

Moscow, Doklady Akademii Nauk SSSR, Vol 193, No 6, 1970, pp 1402-1405

Abstract: A generalized model of ion transport through artificial phospholipid membranes is presented. Passage of electric current through the membrane is re-

USSR

UDC 547.241

CHENBORISOV, R. Sh., and MARKIN, V. V.

"Preparation and Properties of Phenylhydrazides of Alkylthioalkylphosphonous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 1, Jan 70, pp 43-46

Abstract: Nine title compounds (I) were prepared in 87-93% yield by adding slowly alkylthioalkylphosphonous chloride to a mixture of phenylhydrazine and triethylamine in ethyl ether under nitrogen at 0°, filtering off the triethylammonium chloride precipitate, then distilling the filtrate in a molecular still. All I compounds are liquids which decompose on normal distillation. Characteristic P-S bands were detected in IR spectra of I. The physical constants of I were tabulated. The I compounds reacted exothermally with sulfur to form addition compounds - alkylthioalkylphosphonic phenylhydrazides (II), viscous undistillable oils (yields 90-94%). IR bands indicative of PSSR group were present in the spectra of all II. Predictably I reacted exothermally with Schiff bases, e.g., p-benzylidenetoluidine, in petroleum ether under nitrogen at 45-50° to give 28-64% yields of crystallized addition compounds. The alkylthioalkyl(p-toluino)benzyl-N-anilinophosphazine (III) structure was

1/2

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CHENBORISOV, R. Sh., et al, Zhurnal Obshchey Khimii, Vol 40, No 1, Jan 70, pp 43-48

attributed to these compounds, because they did not add S even on heating and gave phenylhydrazine hydrochloride on acid hydrolysis. I easily reacted, typically at 30-35°, with aldehydes and ketones to give 60-90% yields of $C_2H_5P(SR)(O)CR'R''NHNHC_6H_5$ which do not add S. There are IR bands indicative of P=O and NH groups in the spectra of the above compounds.

2/2

Acc. Nr: AP0053348 Abstracting Service: CHEMICAL ABST. 5/70 Ref. Code: UR0079

111568x Preparation and properties of phenylhydrazides of alkylthioalkylphosphonous acids. Chenborisov, R. Sh.; Markin, V. V. (USSR). *Zh. Obshch. Khim.* 1970, 40(1), 43–8 (Russ). To 10.8 g $PhNHNH_2$ and 10.1 g Et_3N in Et_2O was added under N at 0°, 15.6 g RP(SR)Cl, and after removal of $Et_3N.HCl$ after 30–40 min the mixt. gave, on distn. in a mol. still (130–40° bath temp.), $RP(SR^1)NHNHPh$ (I) (R and R^1 shown): Et, Et, 87%, d^{20} 1.0904, n_D^{20} 1.5915; Et, iso-Pr, 89%, 1.0634, 1.5780; Et, Bu, 88%, 1.0582, 1.5745; Et, iso-Amyl, 93%, 1.0488, 1.5685; Me, Et, 87%, 1.1099, 1.6030; Me, iso-Pr, 90%, 1.0902, 1.5900; Me, Bu, 90%, 1.0767, 1.5810; Me, iso-Amyl, 92%, 1.0594, 1.5740; Et, Ph, 88% —, —(viscous oil). The products underwent much decompn. on attempted normal distn. The ir spectra showed the PS band at 510 cm^{-1}. I and PhCH:$NC_6H_4R^2$ in petroleum ether under N at 50° 2–3 hr gave $RP(SR^1)(:NNH\text{-}Ph)CHPhNHC_6H_4R^2$ (R, R^1, and R^2 shown, resp.): Me, Bu, *p*-Me, m. 151–2°; Et, iso-Pr, *m*-Me, m. 152–4°; Et, iso-Pr, H, m. 145–7°; Me, iso-Amyl, *p*-NO_2, m. 147–8°; Me, Bu, *p*-NO_2, m. 149–50°. Addn. of S to I was exothermic and gave viscous

1/2

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undistillable $RP(SR^1)(S)NHNHPh$: Me, iso-Pr; Me, Bu; Et, Et; Et, Bu. All gave ir bands at 667 cm^{-1} indicative of PS_2R grouping. R^1R^2CO and $PhNHNHP(SR)Et$ in 30 min at 30–5° gave $EtP(SR)(O)CR^1R^2NHNHPh$ (R, R^1, and R^2 shown, resp.): Et, H, Me, 70%, $b_{0.6}$ 140°, $n^{25}D$ 1.5732; Et, Me, Et, $b_{0.4}$ 140°, 1.5642; Bu, Me, Et, $b_{0.6}$ 145°, 1.5498; Et, Et, Bu, b_1 150°, 1.5283; Bu, Et, Bu, b_1 150°, 1.5303; Bu, H, Me, $b_{0.6}$ 140°, 1.5558; Et, H, Pr, $b_{0.6}$ 140°, 1.5552; Bu, H, Pr, $b_{0.6}$ 140°, 1.5432; Et, H, C_4H_{11}, $b_{0.6}$ 160°, 1.5435; Bu, H, C_4H_{11}, $b_{0.4}$ 160°, 1.5290; Et, H, 2-furyl, $b_{0.6}$ 140°, 1.6136; Bu, H, 2-furyl, $b_{0.6}$ 140°, 1.5950. These did not add S. G. M. Kosolapoff

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UDC: None

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"Chemical Laser of Mixed Difluoramin With Hydrogen"

Moscow, Sbornik kratkiye soobshcheniya po fizike, No 11, November 1971, pp 3-9

Abstract: This brief communication reports oscillations obtained from oscillatory-rotatory transitions of HF molecules resulting from the reaction of NF_2H with hydrogen, specifically the time variations of the gain yielded by the mixture as a function of the experimental conditions. The experimental equipment consisted of two lasers, an oscillator, and an amplifier, excited by an electrical discharge through the mixture. The oscillator was a quartz tube 85 cm long and 1.7 cm in diameter, with LiF windows set at the Brewster angle. Determinations were made of the optimal relationships between the pressures of the NF_2H and H_2 in the mixture, and a curve is plotted of the energy of the pulse oscillation in the mixture as a function of the ratio of the two pressures. Curves are also plotted for the gain factor in the mixture as a function of time. The authors express their thanks to L. V. Kulakov for his help in plotting the pulse energy spectrum.

1/1